

I-5 Alternative Fuels Corridor Economic Feasibility Study

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Washington State
Department of Transportation

Conceptual Proposals:

**SR 520 Concession
Financing**

**WSF Terminal Joint
Development**

Alt Fuels Corridor

Fiber optic
telecommunications

Long-haul truck
parking

Stampede Pass rail
corridor

***A transportation PPP to
spur private development
of refueling & recharging
infrastructure for
renewable fuels?***

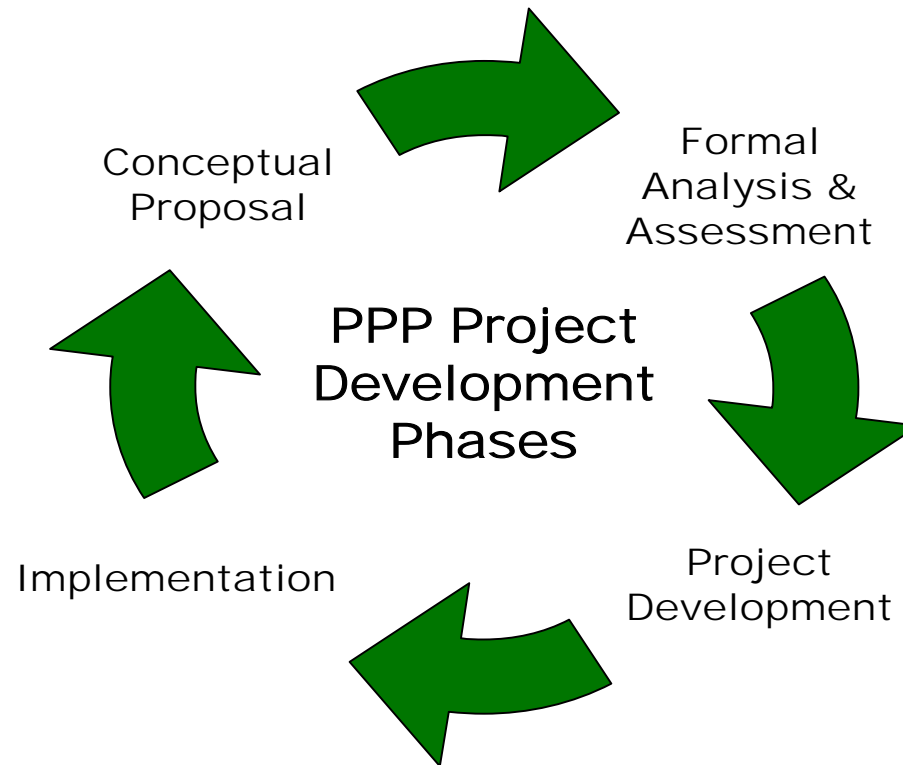
Formal Analysis (2007-09):

SR 520 Concession
Financing

WSF Terminal Joint
Development

**Alt Fuels Corridor
Economic Feasibility
Study:**

- Legislative funding (\$200,000 in 07-09)
- Consultant team of PB Consult and UC-Davis Transportation Institute
- DCTED and WSU Energy Program as key advisers



Alternative Fuels Corridor: Basic Concept

Public/Private Partnerships to Spur Development of Refueling Infrastructure

- State will allow use of land at strategic locations along the I-5 Corridor.
- Private industry will install and operate refueling/recharging infrastructure.
- State will actively assist and promote existing retailers and state-host sites along the I-5 corridor.

“Next Generation” Renewable Fuels and Technologies Targeted:

- Biofuels: high-blend biodiesel (B99) and ethanol (E85).
- Fast-charge electric (including battery exchange).
- Hydrogen fuel cell technology.

Enable Interstate Travel in I-5 Corridor (BC-to-Baja “Green Highways”)

- PPP’s used to fill gaps in existing network, making interregional and interstate travel viable.
- USDOT-designated “Corridor of the Future Designation” and pledged support.
- WA/OR/CA working under tri-state MOU signed DOT Secretary/Directors in summer, 2008.
- MOU between Washington and British Columbia to cooperate on Alternative Fuels Corridor initiatives.

Economic Feasibility Study

Analytical Steps:

1. Analyze the typical retail gas station business model (capital and operating metrics).
2. Model the capital and operating costs of a conceptual alternative fuel station operating in Washington's I-5 corridor.
3. Based on the model, forecast cash flows from operations over time to determine basic economic feasibility of the enterprise.
4. Station spacing analysis: estimate vehicle range by technology, and compare against the existing alternative fuels retailers to determine the optimal station spacing distances and locations.

Key Findings

Traditional Gas Station Business Model:

- Land is the single largest capital cost for typical gas stations.
- Gasoline sales generate a majority of the revenue, but in-store sales contribute most to the profits.

Capital & Operating Characteristics of (Conceptual) Alt Fuels Station:

- Capital and operating cost varies greatly by fuel or technology type.
- State's partnership contribution (use of land) reduces start-up costs by about 33%.

Cash Flow Modeling & Basic Feasibility:

- Some fuel offerings operate at a loss in early years, but attain profitability over time.
- Most fuel scenarios require supplemental revenues or capital cost reductions to be profitable in the near term.
- Pairing different fuel types together at same location helps the business case of both fuel types.
- In the mid-to-longer term, the enterprise could pay lease costs for the use of state lands.

Station Spacing Analysis:

- A minimum of 2 stations are needed in Washington's I-5 corridor to serve interregional travel by fast-charge electricity and hydrogen.
- At least one biofuel station is needed in this same corridor.
- The preferred number of stations for each fuel type is 5.

Conclusion: PPP for Alternative Fuels Corridor is Economically Feasible

Biofuels have the most momentum in the market and appear to be the most economically viable immediately.

Electricity is inexpensive to provide and appears economically viable due to low capital requirement.
Caveat: unit cost of fast-charge is much higher than charging at home.

Hydrogen demand not expected to be strong enough near-term to be economically viable.

Fueling Station Offering	15-Year Concession IRR	30-Year Concession IRR
Electricity Kiosk (Standalone)	0% to 15% IRR	> 15% IRR
Hydrogen / Electricity Kiosk	< 0% IRR	0% to 15% IRR
Biofuels (Standalone)	0% to 15% IRR	> 15% IRR
Biofuels / Electricity Kiosk	> 15% IRR	> 15% IRR
All Fuels Combined	> 15% IRR	> 15% IRR

Estimated IRR for 15- and 30-Year Concession: Base Case

Next Generation Fuel Stations: Think Small

Propel Biodiesel: only a 200 sq ft pad



PGE recharging spots in Portland



Hydrogen Fuel Station at Honda test site



Deployed: minimal impact to existing site



What Could a PPP Pilot Project Look Like?

Safety First

- Must not jeopardize safety of operations on state highways, at maintenance facilities or at rest areas.
- Fueling and electrical equipment/handling must conform to industry standards and best practices.

Fuels and Technologies

- Only next-generation renewable fuels and technologies not currently provided in the marketplace – (no gasoline, no B20, etc.).
- Technology-neutrality: encourage compatibility and interoperability over proprietary systems.

Adhere to Original Purpose of the Pilot Project: Enabling Interstate Travel

- Only the I-5 corridor for this pilot project;
- Host sites restricted to filling gaps in existing alt fuels network, regardless of profit potential elsewhere.

What Could a PPP Pilot Project Look Like?

(continued)

Support Private Business and Infrastructure Development

- Ensure host sites are not in competition with existing businesses offering the same fuels/technologies.
- Provide right-of-first refusal to any business wanting to offer these services in same geographic area.
- Do not provide services for commercial trucks. Provide information, support and marketing to existing truck stop operators and other alternative fuel retailers within the Alt Fuels Corridor.
- Once the host site enterprise reaches target of 15% IRR, reduce or eliminate state land subsidy.

Issues To Be Resolved

Authorizations & Legislative Support

- Federal approval required if within interstate ROW (possible announcement soon).
- No funding in state transportation budget for further transactional work (e.g., consultant/legal/procurement).

Negotiations

- Randolph-Sheppard Act gives right-of-first refusal for vending services at state facilities to Department of Services for the Blind. Agreement must be reached to allow any activities that might encroach on their program rights.
- Organized labor needs assurances that their members will not be negatively impacted.

Operations

- Ventures must not conflict with WSDOT SRA strategic plan.
- WSDOT operational needs must be considered at proposed host sites.

Business Climate

- Current economic conditions may affect investor appetite for this pilot project.

Questions?

For more information on the I-5 Alternative Fuels Corridor
Economic Feasibility Study, please contact:

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